Message (Digitally Signed)

From: JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW [catherine.jerrard@us.af.mil]
Sent: 7/21/2020 1:21:58 PM
To: Wayne Miller [Miller.Wayne@azdeq.gov]
CC: steve@uxopro.com; D'Almeida, Carolyn [dAlmeida.Carolyn@epa.gov]
Subject: 2020-7-16 - wafb -ADEQ requests if ST012 EBR remedy changes will be evaluated
Attachments: Untitled attachment 00004.txt; smime.p7s

Wayne-

The ST012 pilot study SIP results show that microorganisms in the subsurface at the four locations tested can be enhanced via sulfate injections to metabolize labeled benzene and incorporate the carbon into cell membrane (increased biomass) and/or into dissolved inorganic carbon (carbon dioxide) for energy. The results indicate a high level of incorporation into biomass (1,600 to 3,000‰ average PLFA $\delta^{13}C$) at eight weeks and a high rate of utilization resulting in a 1,000‰ fold enrichment in dissolved inorganic carbon $\delta^{13}C$ which is conclusive evidence of benzene biodegradation at each location.

The current site conditions and sampling results indicate EBR has been effective in the areas where the target sulfate concentration ranges have been maintained. No remedy changes are anticipated at this time.

The anticipated path forward is to conduct additional phases of EBR to maintain current favorable degradation conditions and expand to other areas of the site and reduce benzene concentrations in groundwater to levels that will enable monitored natural attenuation to continue to reduce residual benzene to meet the remedial goals.

We can discuss further when you have reviewed the data. Thanks.

Cathy

//SIGNED//
CATHY JERRARD, P.E., PMP
AFCEC/CIBW
706 Hangar Road
Rome, New York 13441
315-356-0810 (office)
315-723-4509 (cell)
email: catherine.jerrard@us.af.mil

From: Steven Willis <steve@uxopro.com>
Sent: Thursday, July 16, 2020 6:53 PM
To: Wayne Miller <miller.wayne@azdeq.gov>; JERRARD, CATHERINE V CIV USAF HAF AFCEC/CIBW <catherine.jerrard@us.af.mil>
Cc: Carolyn dAlmeida <dalmeida.carolyn@epamail.epa.gov>
Subject: [Non-DoD Source] RE: 2020-7-16 - wafb -ADEQ requests if ST012 EBR remedy changes will be evaluated

I don't see anything in this data that would require a re-evaluation of the remedy at this time, based on a limited dataset. It looks like there are anaerobic BTEX degraders and SRBs there, but I think the difficult part will be getting the sulfate distributed throughout the plume in order to grow the bacteria colonies. We may need to periodically deploy Biotrap samplers in selected wells as the sulfate, hopefully, disperses throughout the plume. Eleanor will be doing a more thorough evaluation of the data and I'll have her provide a brief write-up when she completes her evaluation. I think we'll also have to evaluate the data and conclusions in the Pilot Test Report before making any decisions that affect the overall remedy.

Steve Willis
UXO Pro, Inc.
steve@uxopro.com
480-316-3373

Sent from Mail for Windows 10

From: Wayne Miller
Sent: Thursday, July 16, 2020 3:10 PM
To: catherine.jerrard@us.af.mil
Cc: Carolyn dAlmeida; Steven Willis
Subject: 2020-7-16 - wafb -ADEQ requests if ST012 EBR remedy changes will be evaluated

Can you please let me know if the Microbial Insights Quant Array Stable Isotope Probe (SIP) results will initiate remedy altering discussion, such as adjusting redox conditions or other remedy changes?

Thank you.

Wayne Miller

Project Manager,

Federal Projects Unit,

Remedial Projects Section,

Waste Programs Division
Ph: 602-771-4121

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